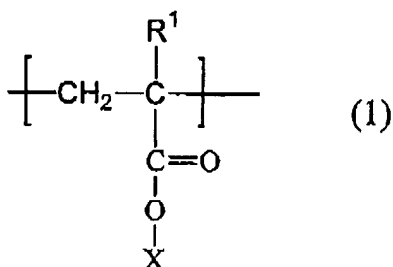


WHAT IS CLAIMED IS:

1. A chemical amplification resist composition comprising a treated resin (1)
obtained by contacting crude resin (1) with activated carbon, an acid generator and a
5 solvent,
wherein resin (1) is
(a) a (meth)acrylic resin which is insoluble or poorly soluble in an alkali aqueous
solution and becomes soluble in an alkali aqueous solution by the action of an acid, and
which comprises a repeating unit having an alicyclic hydrocarbon group in its side
10 chain (hereinafter referred to as "Resin (a)") or
(b) a styrenic resin which is insoluble or poorly soluble in an alkali aqueous solution
and becomes soluble in an alkali aqueous solution by the action of an acid, and which
comprises a repeating unit derived from hydroxystyrene (hereinafter referred to as
"Resin (b)").
- 15 2. The chemical amplification resist composition according to Claim 1,
wherein the resin (1) contains a repeating unit having acid labile group.
3. The chemical amplification resist composition according to Claim 2,
wherein the repeating unit having acid labile group is a repeating unit having a group
dissociated by the action of an acid.
- 20 4. The chemical amplification resist composition according to Claim 3,
wherein the content of the repeating unit having a group dissociated by the action of an
acid in the resin (1) is 10 to 80 % by mol.
5. The chemical amplification resist composition according to Claim 1,
wherein the resin (1) is Resin (a) and the repeating unit having a alicyclic hydrocarbon
25 group in its side chain is at least one repeating unit selected from the group consisting of

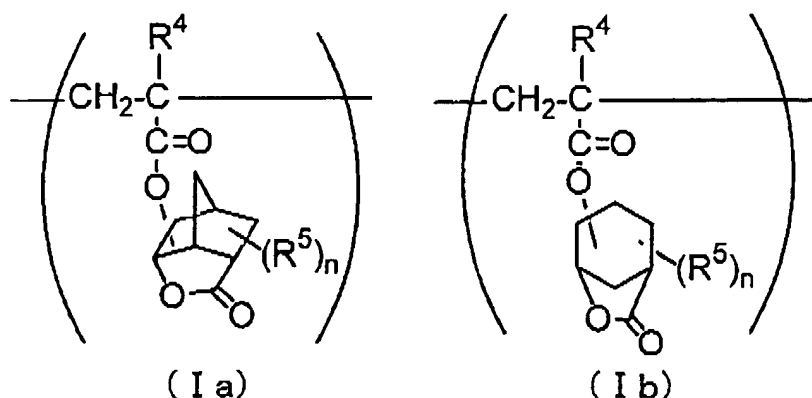
a repeating unit derived from 2-alkyl-2-adamantyl (meth)acrylate and a repeating unit derived from 1-(1-adamantyl)-1-alkylalkyl.

6. The chemical amplification resist composition according to Claim 3, wherein the repeating unit having a group dissociated by the action of an acid is a
5 repeating unit of the formula (1)



- wherein R¹ represents hydrogen, methyl or trifluoromethyl, and X represents a residue of tertiary alcohol or a group represented by the formula of -CH(R²)-OR³, wherein R² represents hydrogen or C1-5 alkyl, R³ represents C1-3 alkyl, (alicyclic
10 hydrocarbyl)oxyalkyl or (alicyclic hydrocarbyl)carbonyloxyalkyl, or R² and R³ bond to form alkylene having 5 to 10 carbon atoms wherein at least one -CH₂- in the alkylene other than the -CH₂- connected to the adjacent -O- may be substituted by -O-.

7. The chemical amplification resist composition according to Claim 1 wherein the resin (1) is Resin (a) and Resin (a) further comprises at least one repeating unit
15 selected from the group consisting of a repeating unit derived from 3-hydroxy-1-adamantyl (meth)acrylate, a repeating unit derived from 3,5-dihydroxy-1-adamantyl (meth)acrylate, a repeating unit derived from (meth)acryloyloxy-γ-butyrolactone wherein at least one hydrogen on the lactone ring may optionally be substituted by alkyl, a repeating unit of the following formula (Ia)
20 and a repeating unit of the following formula (Ib):

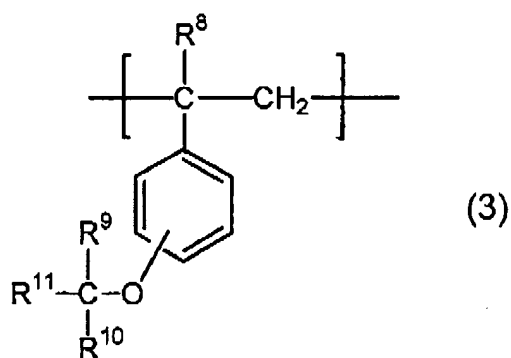


wherein R^4 represents hydrogen, methyl or trifluoromethyl, R^5 represents methyl or trifluoromethyl, n represents an integer of from 0 to 3, and when n is 2 or 3, each of R^5 is the same or different.

- 5 8. The chemical amplification resist composition according to Claim 1 wherein the resin (1) is Resin (a) and Resin (a) further comprises at least one repeating unit selected from the group consisting of a repeating unit derived from an aliphatic unsaturated dicarboxylic anhydride and a repeating unit derived from 2-norbornene.

- 10 9. The chemical amplification resist composition according to Claim 1 wherein the resin (1) is Resin (a) and the crude Resin (a) is a resin produced by radical polymerization of a monomer having (meth)acrylic ester structure and leading to a repeating unit having an alicyclic hydrocarbon group in its side chain in an organic solvent selected from the group consisting of aromatic hydrocarbon, ether, glycol ether ester, ester, ketone and alcohol at a temperature of -50 to 100 °C.

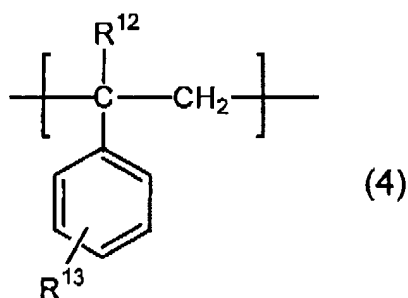
- 15 10. The chemical amplification resist composition according to Claim 3 wherein the resin (1) is Resin (b) and the repeating unit having a group dissociated by the action of an acid is a repeating unit of the formula (3)



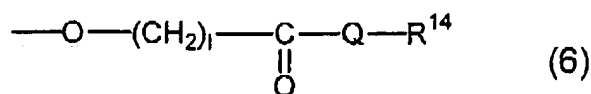
wherein R^8 represents hydrogen or methyl, R^9 and R^{10} each independently represents hydrogen, C1-6 alkyl, C3-6 cycloalkyl, C1-6 haloalkyl, C3-6 halocycloalkyl, or optionally substituted phenyl, or R^9 and R^{10} bond to form C5-10 alkylene chain, R^{11} represents C1-10 alkyl, C3-10 cycloalkyl, C1-10 haloalkyl, C3-10 halocycloalkyl or C7-12 aralkyl.

11. The chemical amplification resist composition according to Claim 1 wherein the resin (1) is Resin (b) and Resin (b) further comprises at least one repeating unit selected from the group consisting of a repeating unit of the formula (4) and a repeating unit of the following formula (5):

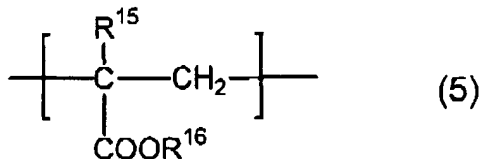
formula (4)



wherein R^{12} represents hydrogen or methyl, R^{13} represents hydrogen, C1-4 alkyl, C1-8 alkoxy, C3-8 cycloalkyloxy or a group of the following formula (6),



wherein R^{14} represents C1-8 alkyl, C6-10 aryl or saturated heterocyclic group, Q represents single bond or oxygen, and l denote 0 or natural number, formula (5)



- 5 wherein R^{15} represents hydrogen, methyl or trifluoromethyl, and R^{16} represents hydrocarbon group having bonding site at primary or secondary carbon.

12. The chemical amplification resist composition according to Claim 1 wherein the Resin (1) is Resin (b) and the crude Resin (b) is a resin produced i) by living radical polymerization or living anion polymerization of protected
10 hydroxystyrene, deprotection and re-protection, or ii) by radical polymerization of protected hydroxystyrene or protected hydroxystyrene and vinyl monomer, deprotection and re-protection.

13. The chemical amplification resist composition according to Claim 1 which further comprises an amine.

- 15 14. The chemical amplification resist composition according to Claim 1 wherein clogging degree of the composition is 0.9 or more when the composition is measured and calculated by the following definition.

Definition of Clogging Degree of Resist Composition

- At 23 °C, resist composition is poured into a filtration equipment in which a round and
20 track-etch membrane filter (diameter: 47mm, average pore size: 0.05 μm , thickness: 6 μm , pore density: 6×10^8 pores/ cm^2) is set to a holder having volume of 300 ml, then pressure filtration is started at a pressure of 100 kPa. The filtrate is collected in a receiver on a balance, and weight change of the filtrate is checked every one minute.

Filtration time and accumulated weight of filtrate discharged are measured and linear velocity is calculated by dividing the weight of filtrate discharged per one minute by effective filter area. Maximum value of linear velocity reached in 10 minutes after starting the filtration is defined as V1 (the linear velocity at initial standard point). The
 5 linear velocity at the point the accumulated weight of filtrate discharged reaches to 15 g converted to the weight of solid components of the resist composition is measured and calculated in the same manner and is defined as V2. Clogging Degree is a value calculated by dividing V2 by V1.

15 15. A process for producing a chemical amplification resist composition which comprises contacting crude resin (1) with activated carbon to obtain treated resin(1), and mixing the treated (meth)acrylic resin, an acid generator and an organic solvent, wherein the resin (1) is

(a) a (meth)acrylic resin which is insoluble or poorly soluble in an alkali aqueous solution and becomes soluble in an alkali aqueous solution by the action of an acid, and
 15 which comprises a repeating unit having an alicyclic hydrocarbon group in its side chain (hereinafter referred to as "Resin (a)") or

(b) a styrenic resin which is insoluble or poorly soluble in an alkali aqueous solution and becomes soluble in an alkali aqueous solution by the action of an acid, and which comprises a repeating unit derived from hydroxystyrene (hereinafter referred to as
 20 "Resin (b)").

16. The process according to Claim 15 wherein the resin (1) is Resin (a) and crude Resin (a) is produced by radical polymerization of a monomer having (meth)acrylic ester structure and leading to a repeating unit having an alicyclic hydrocarbon group in its side chain in an organic solvent selected from the group
 25 consisting of aromatic hydrocarbon, ether, glycol ether ester, ester, ketone and alcohol at

a temperature of -50 to 100 °C.

- 17 The process according to Claim 15 wherein the resin (1) is Resin (b) and
crude Resin (b) is produced i) by living radical polymerization or living anion
polymerization of protected hydroxystyrene, deprotection and re-protection, or ii) by
5 radical polymerization of protected hydroxystyrene or protected hydroxystyrene and
vinyl monomer, deprotection and re-protection.